

## Compositions and Methods for Reverse Transcription of Nucleic Acid Molecules

### ABSTRACT

The present invention is generally related to compositions and methods for the reverse transcription of nucleic acid molecules, especially messenger RNA molecules. Specifically, the invention relates to compositions comprising mixtures of polypeptides having reverse transcriptase (RT) activity, and to methods of producing, amplifying or sequencing nucleic acid molecules (particularly cDNA molecules) using these compositions or polypeptides, particularly at temperatures above about 55°C. The invention also relates to nucleic acid molecules produced by these methods, to vectors and host cells comprising these nucleic acid molecules, and to the use of such nucleic acid molecules to produce desired polypeptides. The invention also relates to methods for producing Rous Sarcoma Virus (RSV) and Avian Myeloblastosis Virus (AMV) RTs or other Avian Sarcoma-Leukosis Virus (ASLV) RTs ( $\alpha$  and/or  $\beta$  subunits thereof), to isolated nucleic acid molecules encoding such RSV RT, AMV RT or other ASLV RT subunits, to vectors and host cells comprising these isolated nucleic acid molecules and to RSV RT, AMV RT and other ASLV RT subunits produced by these methods. The invention further relates to nucleic acid molecules encoding recombinant heterodimeric RT holoenzymes, particularly heterodimeric RSV RTs, AMV RTs or other ASLV RTs (which may be  $\alpha\beta$  RTs,  $\beta\beta$  RTs, or  $\alpha$  RTs), vectors (particularly baculovirus vectors) and host cells (particularly insect and yeast cells) comprising these nucleic acid molecules, methods for producing these heterodimeric RTs and heterodimeric RTs produced by these methods. The invention also relates to kits comprising the compositions, polypeptides, or RSV RTs, AMV RTs or other ASLV RTs of the invention.